

Notice of Allowability	Application No.	Applicant(s)	
	09/586,282	YEDIDIA ET AL.	
	Examiner	Art Unit	
	Kandasamy Thangavelu	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to October 25, 2004.
2. ☒ The allowed claim(s) is/are 1 and 3-15.
3. ☒ The drawings filed on 05 November 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

[Signature]
KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER

DETAILED ACTION

Introduction

1. This communication is in response to the Applicants' communication dated October 25, 2004. Claims 1 and 15 were amended. Claims 1 and 3-15 of the application are pending.

Reasons for Allowance

2. Claims 1 and 3-15 of the application are allowed over prior art of record.

3. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

The closest prior art of record shows:

(1) a method of inferring a scene from a test image by a training process using acquired images and corresponding scenes; the images and the scenes are partitioned into plurality of patches; each of the patches is represented by a vector; the probabilistic relationship between the image and scene vectors is modeled as a Markov network; a test image is acquired during the inference phase and is partitioned into a plurality of patches which are represented by vectors; candidate scene vectors for the test image vectors are located in the training data; the probabilities are propagated in the network until a predetermined termination condition is

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reached to infer the scene from the image; the Markov network allows each scene node to update its probability based on accumulated local evidence gathered from other nodes during the inference phase (**Freeman et al.**, U.S. Patent 6,496,184);

(2) representation of probabilistic relationships among variables which can take one of a mutually exclusive possible states using Bayesian networks; the variables correspond to the nodes in the network and relationships between nodes correspond to the arcs; when there is an arc between two nodes, the probability distribution of the first node depends on the value of the second node; to reduce the processing time required in inference, a clustering scheme is used to divide the database into a number of clusters; each cluster contains data that tend to be similar; when making inferences, only data in the cluster need to be considered; the number of clusters are determined using an array of mixtures of Bayesian networks (**Heckerman**, U.S. Patent 6,529,891); and

(3) a Bayesian network to troubleshoot a system using probability theory; the Bayesian network represents the casual relationships between variables using conditional probability distributions to variables given their parents; methods for exact updating of probabilities of the Bayesian networks are developed; the junction-tree method is identified as the most efficient method for exact belief updating of the Bayesian networks; this method clusters the variables to form a tree, with all loops eliminated; a message passing scheme updates the beliefs of all unobserved variables given the observed variables (**Skaaning et al.**, U.S. Patent 6,535,865).

3.1 Applicants' first set of claims consists of Claims 1 and 3-14.

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Independent Claim 1 is directed to a computer implemented method for determining probabilities of states of a system represented by a model including a plurality of nodes connected by links. The claim identifies the uniquely distinct features of:

“identifying nodes in intersections of clusters, and intersections of intersections of clusters as regions of nodes” and “defining messages based on the regions of nodes, each message having associated sets of source nodes and destination nodes and a value and a rule depending on other messages and selected links connecting the source nodes and destination nodes”.

The closest prior art fails to teach or fairly suggest identifying nodes in intersections of clusters, and intersections of intersections of clusters as regions of nodes and defining messages based on the regions of nodes, each message having associated sets of source nodes and destination nodes and a value and a rule depending on other messages and selected links connecting the source nodes and destination nodes, as claimed by the Applicants. Therefore, Claims 1 and 3-14 are deemed novel and allowable.

3.2 Applicants' second set of claims consists of Claim 15.

Independent Claim 15 is directed to a computer implemented method for determining probabilities of states of a system represented by a model including a plurality of nodes connected by links. The claim identifies the uniquely distinct features of:

“identifying nodes in intersecting clusters, and intersections of intersecting clusters as regions, and intersections of regions as sub-regions” and

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“defining messages between regions and direct sub-regions directly connected in the hierarchy, each message having associated sets of source nodes and destination nodes and a value and a rule depending on other messages and selected links connecting the source nodes and destination nodes, the destination nodes being those nodes in the sub-region, and the source nodes being those nodes in the region and outside the sub-region”.

The closest prior art fails to teach or fairly suggest identifying nodes in intersecting clusters, and intersections of intersecting clusters as regions, and intersections of regions as sub-regions, and defining messages between regions and direct sub-regions directly connected in the hierarchy, each message having associated sets of source nodes and destination nodes and a value and a rule depending on other messages and selected links connecting the source nodes and destination nodes, the destination nodes being those nodes in the sub-region, and the source nodes being those nodes in the region and outside the sub-region, as claimed by the Applicants. Therefore, Claim 15 is deemed novel and allowable.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is

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571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on 571-272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

K. Thangavelu
Art Unit 2123
January 6, 2005



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER